

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

C47 TECHNOLOGIES LLC,

Plaintiff,

v.

TCL TECHNOLOGY GROUP CORP.,
TCL COMMUNICATION
TECHNOLOGY HOLDINGS LTD., TCL
ELECTRONICS HOLDINGS LTD., AND
TCT MOBILE (US) INC.

Defendants.

Civil Action No. 2:24-cv-417

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff C47 Technologies LLC (“C47” or “Plaintiff”), for its Complaint against Defendants TCL Technology Group Corporation f/k/a TCL Corporation (“TCL Technology”), TCL Communication Technology Holdings Limited (“TCL Comm. Tech.”), TCL Electronics Holdings Limited (“TCL Electronics”), and TCT Mobile (US) Inc. (“TCT Mobile (US)”) (collectively, “TCL” or “Defendants”), alleges the following:

NATURE OF THE ACTION

1. This is an action for patent infringement arising under the Patent Laws of the United States, 35 U.S.C. § 1 *et seq.*

THE PARTIES

2. Plaintiff is a limited liability company organized and existing under the laws of the state of Nevada with a principal place of business at 6605 Grand Montecito Parkway, Suite 100, Las Vegas, Nevada 89149.

3. Defendant TCL is a corporation organized and existing under the laws of China, with its principal place of business at TCL Keji Daxia, No.17, Huifeng 3rd Road, Zhongkai HighTech Zone Huizhou, Guangdong, 516000 China. TCL is a leading manufacturer and seller of smartphones, tablets, and smart televisions in the world and in the United States. Upon information and belief, TCL does business in Texas, directly or through intermediaries, and offers its products and/or services, including those accused herein of infringement, to customers and potential customers located in Texas, including in the Judicial District of the Eastern District of Texas.

4. On information and belief, Defendant TCL Comm. Tech. is a company organized and existing under the laws of the Cayman Islands with its principal place of business at 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, New Territories, Hong Kong. On information and belief, Defendant may be served pursuant to the provisions of the Hague Convention. TCL Comm. Tech. is a leading manufacturer and seller of smartphones in the world and throughout the United States. On information and belief, TCL Comm. Tech. does business in Texas and in the Eastern District of Texas, directly or through its subsidiaries.

5. On information and belief, Defendant TCL Electronics is a company organized and existing under the laws of the Cayman Islands, with its principal place of business and headquarters at 7th Floor, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, New Territories, Hong Kong. On information and belief, Defendant may be served pursuant to the provisions of the Hague Convention. TCL Electronics is a leading manufacturer and seller of smartphones in the world and throughout the United States. On information and belief, TCL Electronics does business in Texas and in the Eastern District of Texas, directly or through its subsidiaries.

6. On information and belief, Defendant TCT Mobile (US) is a corporation organized under the laws of the state of Delaware, with its principal place of business at 25 Edelman, Suite 200, Irvine,

California 92618. TCT Mobile (US) is a leading manufacturer and seller of smartphones in the world and throughout the United States. On information and belief, TCT Mobile (US) does business in Texas and in the Eastern District of Texas, directly or through its subsidiaries.

7. Upon information and belief, TCL imports, sells, offers to sell, and/or uses products and services throughout the United States, including within this judicial district, and introduces infringing products and services into the stream of commerce knowing that they would be sold and/or used in this judicial district and elsewhere in the United States.

JURISDICTION AND VENUE

8. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1, et seq. This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

9. This Court has personal jurisdiction over Defendants under the laws of the State of Texas, due at least to their conducting substantial business in Texas and purposeful availment of conducting such business in the State of Texas, including within this judicial district, directly or through intermediaries, including: (i) at least a portion of the infringing conduct alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct and/or deriving substantial revenue from goods and services provided to individuals in the State of Texas.

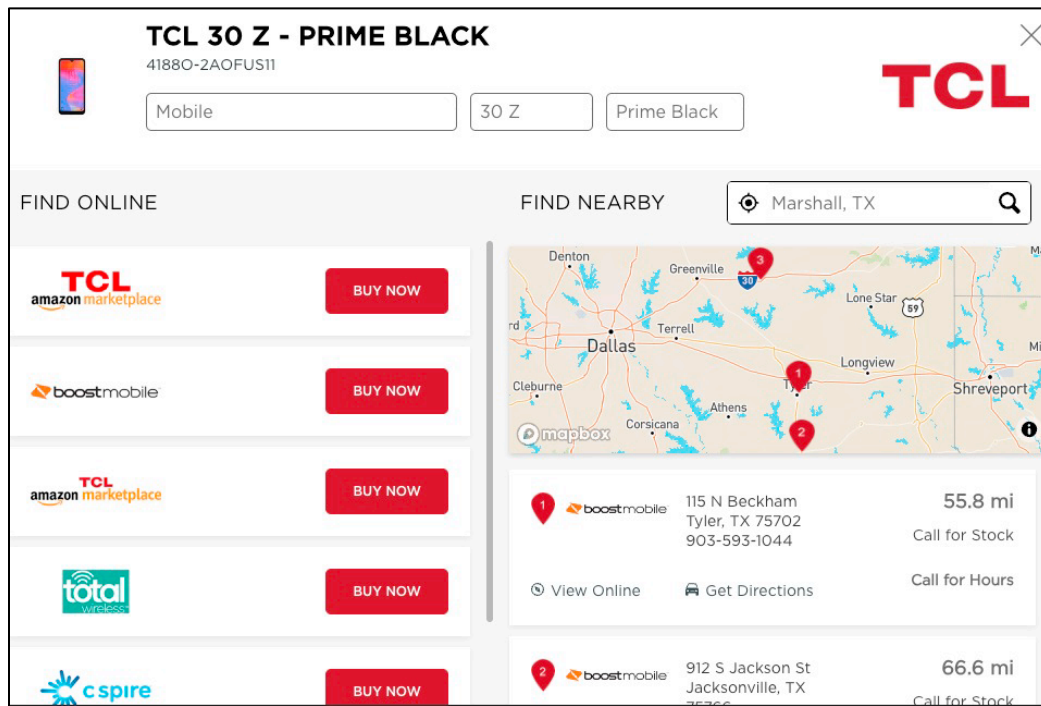
10. This Court also has personal jurisdiction over Defendants based on their introduction and delivery of infringing products and services into the stream of commerce with the expectation that such infringing products would be sold and/or used in this judicial district. *See In re Toyota Hybrid Brake Litig.*, 2021 U.S. District LEXIS 124918 (E.D. Tex. Jul. 6, 2021). Nor would the court's exercise of personal jurisdiction over Defendants violate traditional notions of fair play and substantial justice.

11. Defendants are subject to this Court's jurisdiction pursuant to due process and/or the Texas Long Arm Statute due at least to its substantial business in this State and Judicial District, including (a) at

least part of its past infringing activities, (b) regularly doing or soliciting business in Texas, and/or (c) engaging in persistent conduct and/or deriving substantial revenue from goods and services provided to customers in Texas.

12. Defendants have authorized sellers, sales representatives and customer service agents (“TCL Agents”) that offer, sell and service products pertinent to this Complaint through the State of Texas, including in this Judicial District, and to consumers throughout this Judicial District, such as: Boost Mobile, 115 N Beckham, Tyler, TX 75702.

13. The TCL Agents have fixed geographical locations. They are “regular” and “established” because they operate in a “steady, uniform, orderly, and methodical manner” and are sufficiently permanent. These locations are “of the defendant” because TCL has contractual rights with the TCL Agents in the United States. As shown below, TCL also ratifies these facilities through its advertising of them through its website. See <https://www.tcl.com/us/en/products/mobile/tcl-30-series/tcl-30-z-prime-black.html>.



14. TCL has a defined places and sets out the physical specifications for its exclusive and separate areas within the TCL Agents' locations. TCL also explicitly retains control over the exclusiveness of the defined places and separate areas as well as their locations, resulting in physical locations for TCL within this District.

15. TCL also has regular, physical presences of TCL employees in this District conducting TCL's business. TCL maintains a regular and established place of business at the TCL defined places and separate areas at the TCL Agents' locations by the regular, physical presence of its employees.

16. The TCL Agents are TCL's agents for the purpose of conducting TCLs business in this District because TCL provides regular instructions directing the TCL Agents' performance of the repairing, refurbishing, warehousing, and packaging services that TCL offers to its customers.

17. TCL retains complete, absolute, and exclusive control over the its exclusive and separate areas within the TCL Agents' locations.

18. TCL ratifies its exclusive and separate areas within the TCL Agents' locations because it exercises interim control over the TCL Agents' activities and holds out to the public that TCL's services are being performed at the TCL Agents' locations in this District. Within the exclusive and separate areas within the TCL Agents' locations, TCL has absolute control over their conduct. TCL does not merely use the exclusive and separate areas within the TCL Agents' locations within this District, but controls all aspects of their conduct as it pertains to TCL's exclusive and restrictive exclusive TCL areas.

19. As shown above, venue is proper in this District pursuant to 28 U.S.C. § 1400(b) because Defendant has regular and established physical places of business in this District and have committed acts of patent infringement in the District.

20. Venue is also proper in this Judicial District pursuant to 28 U.S.C. § 1391 because, among other things, TCL Technology, TCL Comm. Tech., and TCL Electronics are not a resident in the United States, and thus may be sued in any judicial district pursuant to 28 U.S.C. § 1391(c)(3).

BACKGROUND

The Invention

21. Peter R. Rogina is the inventor of several U.S. Patents directed to camera systems for image capturing and processing, including U.S. Patent No. 10,984,605 (“the ’605 patent”), titled “Camera Arrangements with Backlighting Detection and Methods of Using Same.”

22. The ’605 patent resulted from the pioneering efforts of Mr. Rogina (hereinafter “the Inventor”) in the area of multicamera systems for image capturing and processing. The Inventor conceived of the inventions claimed in the ’605 patent as a way to improve the combining of digital images from multiple cameras and/or other sensors for display of improved-quality and/or novel perspective images from the merged data. These efforts of the Inventor resulted in the development in the early 2000s of methods and apparatus for multicamera/sensor systems, and methods of using multicamera systems to provide improved-quality and/or novel perspective merged images. At the time of these pioneering efforts, the technology used to combine images for display often resulted in problems such as unnatural brightness when the illumination differed in the images being merged. (*See, e.g.*, ’605 patent at 2:20-46.)

23. The Inventor developed a system including an array of multiple digital cameras and/or sensors that captures pixel data and illumination data for each pixel, and creates a data file associated with such pixel and illumination data that allows for more efficient and accurate merging, storage, and display of the merged data as a single image having improved and more realistic image quality. (*Id.* at 1:31-44; 2:41-64.) Such systems can be used in a variety of applications including, for example, the merger of: (1) actual pixel/image data captured by multiple digital cameras capturing data using distinct parameters (*Id.* at 1:31-44; 2:41-44; 3:11-26; 4:38-40); (2) actual pixel/image data from multiple digital cameras along

with ambient illumination data (*Id.* at 4:44-48; 4:63-5:7); (3) actual pixel/image and illumination data with virtual image data such as augmented reality and telepresence images. (*Id.* at 2:4-40; 4:52-55.)

24. In addition, the Inventor developed the apparatus and methods for capturing images and data for both static images, as well as dynamic images such as those taken consecutively over time to create a series of images such as, but not limited to, those combined to create a video. (*Id.* at 2:65-3:2.). For such dynamic video images, the data obtained (*e.g.*, pixel and/or illumination data) can be used to adjust the combined series of images for a more realistic video appearance to the observer. (*Id.* at 2:57-64.)

25. The Inventor also developed the system for merging multiple images including a camera array having multiple cameras to capture pixel and illumination data of an image using digital cameras using different parameters, and the associated processors required for the parsing, formatting, synchronizing, storing, and combining of such collected data for display as a single improved image. (*Id.* at 3:2-7.)

Advantages Over the Prior Art

26. The patented inventions disclosed in the '605 patent provided many advantages over the prior art, and in particular improved the technology of systems for capturing, merging, and displaying multiple digital images using associated pixel and illumination data obtained from multiple digital cameras and/or sensors in an array, each using distinct parameters for capturing the pixel and/or illumination data. For example, the '605 patent discloses a system including a camera array of multiple cameras and/or sensors mounted in various configurations, each camera or sensor having appropriate circuitry and connectivity with at least one processing chip (processor or application specific IC) used to merge and store pixel and illumination data captured from the individual cameras and/or sensors within the array, in order to create a combined image for display to the observer. (*Id.* at 3:11-4:37; 8:3-16, 8:58-67, 14:8 and 14:19- 20.)

27. Another advantage of the patented invention is that it provides a system and method for providing more realistic combined images by, for example, capturing images using multiple cameras

and/or sensors, formatting and storing the captured pixel and illumination data for each pixel in order to improve the processor's ability to control the merger and storage of the multiple images by, for example, the creation of data files associated with the captured pixel and illumination data that can be used to parse, synchronize, and compress the captured pixel and illumination data. (*Id.* at 1:33-44; 2:65-3:7; 4:18-20; 4:63-5:7; 5:50-67; 7:24-33; 7:51-8:16; 8:31-11:16; 11:61-12:16; 12:38-44.)

28. Another advantage of the patented invention is that illumination in a series of images can change over time, and so the present invention can use illumination data—whether as a parameter of the captured pixel data or as ambient illumination collected simultaneously with the capture of pixel data by a camera, in order to adjust the illumination of any superimposed images—whether virtual or real, whether static or dynamic—in order to maintain a consistent illumination over time within the combined images. (*Id.* at 2:58-64; 4:56-5:14 and 11:33-40.)

Technological Innovation

29. The patented invention disclosed in the '605 patent resolves technical problems related to the operations of systems used for the capture, processing, merger, and display of multiple digital images as a single image. In particular, the '605 patent resolves problems related to the utilization of multiple cameras and/or sensors having different parameters to capture, process, and merge multiple digital images for display as a single image. As the '605 patent explains, prior art methods of combining multiple images often resulted in brightness variations of the combined images resulting in an unnatural appearance—whether with respect to combining real and virtual images whose illumination was “assumed” based on modeling, (*see* '605 patent at 2:4-19), or with respect to combining two actual images (*Id.* at 2:41-44)

30. In addition, the claims of the '605 patent recite inventive concepts that improve the functioning of camera systems in products such as cellular phones, tablets, and similar mobile devices that include camera arrays and associated circuitry, software, firmware, processors, and/or applications that enable

features that combine multiple digital images that are captured using different parameters including, but not limited to, TCL products with various features (*e.g.*, Portrait Mode) found in numerous TCL mobile devices including, but not limited to: (1) the TCL 10 Series line of products; (2) the TCL 20 Series line of products; and (3) the TCL 30 Series line of products.

31. Accordingly, the claims in the '605 patent recite a patentable combination of specific structural elements and corresponding methodologies of using those elements to provide specific data files for improving the processing of the obtained pixel or illumination data in order to merge, store, parse, synchronize, compress and ultimately display the merged data from the multiple images as a single image. The '605 patent does so with sufficient disclosure to ensure that the claims in substance and in practice amount to significantly more than a patent-ineligible abstract idea.

COUNT I – INFRINGEMENT OF U.S. PATENT NO. 10,984,605

32. The allegations set forth in the foregoing paragraphs 1 through 27 are incorporated into this First Claim for Relief.

33. On April 20, 2021, the '605 patent was duly and legally issued by the United States Patent and Trademark Office under the title "CAMERA ARRANGEMENTS WITH BACKLIGHTING DETECTION AND METHODS OF USING SAME."

34. Plaintiff is the assignee and owner of the right, title and interest in and to the '605 patent, including the right to assert all causes of action arising under said patent and the right to any remedies for infringement of it. Additionally, the assignments for the '605 patent were recorded in the U.S. Patent and Trademark Office on January 23, 2024, at Reel/Frame 066335/0987, and on May 10, 2024, at Reel/Frame 067381/0574.

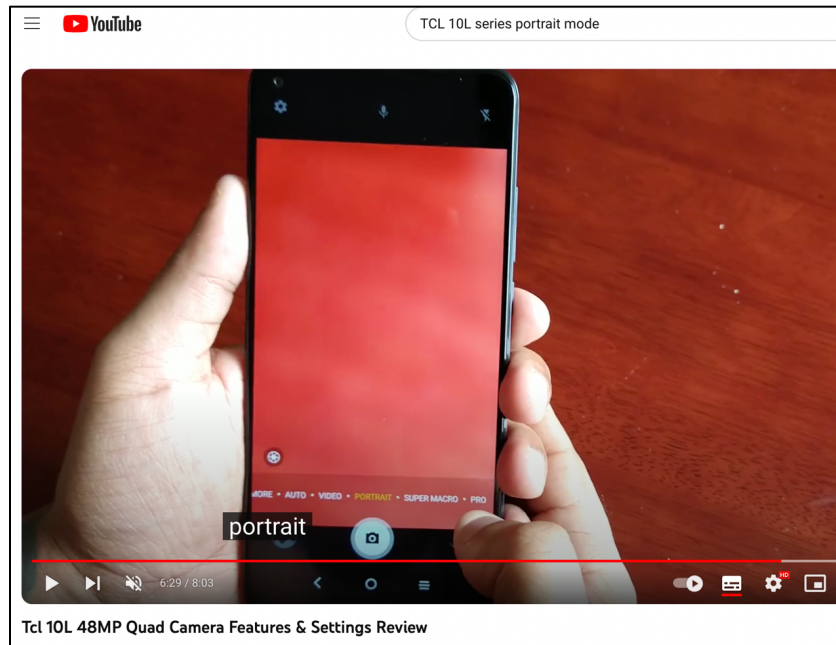
35. Upon information and belief, TCL has directly infringed one or more claims of the '605 patent by making, using, selling, offering to sell, importing and/or providing and causing to be used, products, specifically one or more cellular phones and other mobile devices containing camera arrays with multiple

digital cameras and/or sensors, used in conjunction with circuitry, at least one processor, and software/firmware that enable users of the TCL products to use applications and features including, but not limited to, TCL products with various features (*e.g.*, Portrait Mode) found in numerous TCL mobile devices including, but not limited to: (1) the TCL 10 Series line of products; (2) the TCL 20 Series line of products; and (3) the TCL 30 Series line of products (collectively the “Accused Products”).

36. As shown below, for example, exemplary features of the Accused Products such as the “Portrait Mode” are found in the Accused Products and cause infringement of asserted claims of the ’605 patent.

<p>QUAD REAR CAMERA</p>	<p>detection auto focus (CDAF), laser detection auto focus (LDAF), phase-detection auto focus (PDAF)</p> <p>Zoom: 10X hybrid digital zoom</p> <p>Flash: Dual LED flash</p> <p>Aperture: F1.79 + F2.4 + F2.2 + F1.8</p> <p>Image sensor: GW1 + 3P9 + GC5035 + OV02K10</p> <p>Sensor size: 1/1.7" + 1/3" + 1/5" + 1/2.8",</p> <p>Pixel size: 0.8μm + 1.0μm + 1.12 μm + 2.9μm</p> <p>Lens field of view: 79 °+ 123° + 83° + 77°</p> <p>Video capture: 4K/1080P/720P@30FPS</p> <p>Slow motion video capture: 1080P/720P@120FPS, 720P@240FPS/960FPS</p> <p>Features: Auto zoom, Google Lens, HDR, in-recording snapshots, Light Trace Mode, Panorama Mode, Portrait Mode, Pro Mode, photo filters, scene detection, Slow-Mo Video Mode, Stop-Motion Video Mo</p>	<p>Zoom: 10X digital zoom</p> <p>Flash: Dual LED flash</p> <p>Aperture: F1.8 + F2.2 + F2.4 + F2.4</p> <p>Image sensor: S5KGM1 + GC8034 + GC2385 + GC2385</p> <p>Sensor size: 1/2.25" + 1/4" + 1/5" + 1/5"</p> <p>Pixel size: 0.8μm + 1.12μm + 1.65 μm + 1.65μm</p> <p>Lens field of view: 79° + 118° + 79°+ 86.6°</p> <p>Video capture: 4K@30FPS</p> <p>Slow motion video capture: 1080P@120FPS, 720P@240FPS</p> <p>Features: Google Lens, HDR, in-recording snapshots, Light Trace Mode, Macro Mode, Panorama Mode, Portrait Mode, Pro Mode, real-time bokeh, scene detection, Slow-Mo Video Mode, Stop-Motion Video Mode, Super Night Mode, Wide-Angle Mode</p>
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See <https://www.tcl.com/us/en/products/mobile/comparison-chart>.



See <https://www.youtube.com/watch?v=iAXEkFRG8r0>.



See <https://www.youtube.com/watch?v=AU5UirKEAv4>.

37. The Accused Instrumentalities infringed at least claims 1-3, 5-7, 10-12, 20, 24, 62, and 63 of the '605 patent during the pendency of the '605 patent, and in particular from April 20, 2021 to October

15, 2022. This Complaint is in compliance with 35 U.S.C. §287 as no products have ever been commercialized or licensed by patent owner under the '605 patent.

38. Plaintiff has been harmed by TCL's infringing activities.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully requests the Court enter judgment against Defendant as follows:

1. Declaring that Defendant has infringed the Patents-in-Suit;
2. Awarding Plaintiff its damages suffered because of Defendant's infringement of the Patents-in-Suit;
3. Awarding Plaintiff its costs, reasonable attorneys' fees, expenses, and interest; and
4. Granting Plaintiff such further relief as the Court finds appropriate.

JURY DEMAND

Plaintiff demands trial by jury, under Fed. R. Civ. P. 38.

Respectfully Submitted

/s/ Christopher A. Honea

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